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Research article

An Analyze of the Relationship Between Students' Motivation, Self-efficacy, and Academic Resilience

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Abstract

Academic resilience represents a critical variable in educational success, reflecting students' ability to adapt and thrive in the face of academic challenges. Numerous studies have addressed the issue of academic resilience, as understanding the mechanisms underlying academic resilience as essential for the development of effective interventions to support students. Academic resilience is a multifactorial construct, influenced by personal, social and contextual factors, which needs a complex approach. Being an essential competence for the entire life, the academic environment provides the fertile ground for its development. The present research investigates the extent to which perceived self-efficacy and motivation - both intrinsic and extrinsic - impact students' academic resilience. The study aims to explore how those psychological constructs interact to support adaptive responses in demanding academic environments. A structural equation model was developed and tested on a sample of university students. The findings reveal that academic self-efficacy and intrinsic motivation has a significant and direct positive effect on academic resilience. At the same time, even extrinsic motivation seems to influence negatively the academic resilience, it resulted that it has no direct significant influence on academic resilience. The results underscore the importance of fostering self-efficacy and intrinsic motivation in educational settings, offering critical psycho-pedagogical insights for enhancing students' adaptive capacities.

Keywords:
academic resilience, academic self-efficacy, intrinsic motivation, extrinsic motivation

1. Introduction

Motivation, self-efficacy, and academic resilience represent important variables that significantly influence academic success. Those factors are interconnected and create a dynamic interplay that supports students' ability to overcome challenges, be consistent in their studies, and achieve their academic goals.

Motivation refers to the internal drive or desire that propels individuals to engage in a particular behavior or activity (learning, for example) (Morris et al., 2022), being the psychological process that launches, guides, and maintains goal-oriented actions (Zeidner et al., 2000). It encompasses a series of aspects which include *intrinsic motivation* (driven by internal rewards, such as enjoyment curiosity, and interest) and *extrinsic motivation* (driven by external rewards, like grades, praise or material reward). Motivation plays an important role in academic success by influencing students' effort, perseverance, and engagement in learning activities (Steinmayr et al., 2019).

Self-efficacy is defined as the belief in one's ability to realize a specific task or achieve a particular goal successfully. It represents a key component of the self-concept and plays a crucial role in academic performance. In this respect, students with high self-efficacy are more likely to set challenging goals, resist when facing obstacles, and adopt effective learning strategies (Basileo et al., 2024).

Academic resilience is considered the ability to bounce back from academic setbacks and adversity. It involves a mixture of cognitive, emotional, and behavioral factors that enable students to confront challenges, keep a positive attitude, and continue striving for success. Resilient students are better enabled to manage stress, regulate their emotions, and seek support when needed (Flores-Builes & Andrés-Roqueta, 2023).

This research aimed to understand the extent to which motivation, self-efficacy, and academic resilience are correlated.

2. Theoretical foundation

Trying to analyze the correlation between the abovementioned variables, several researchers illustrated a series of conclusions.

Motivation is closely related to self-determination. People who are intrinsically motivated, are engaged in activities for their pleasure and satisfaction. As Deci et al. (1991) showed, intrinsically motivated behaviors represent the prototypes of self-determination. Motivation and self-efficacy are positively correlated - more motivated students tend to have higher levels of self-efficacy, and vice versa. This suggests that motivation can boost self-efficacy, and self-efficacy can enhance motivation (Li et al., 2023). On the other hand, self-efficacy represents a strong predictor of academic resilience. Students with higher self-efficacy are more likely to exhibit resilience when facing academic challenges because they believe in their ability to overcome obstacles, and find effective coping strategies (Uygur et al., 2023). Motivation and self-efficacy mediate the relationship between parenting styles and academic resilience. Positive parenting practices, such as authoritative parenting, can foster students' motivation and self-efficacy, which contribute to their academic resilience (Shengyao et al., 2024).

Resilience is a complex, multifaceted construct (Cassidy, 2015) seen as the ability to optimally leverage internal and external resources to successfully overcome various obstacles and challenges (Pooley & Cohen, 2010). In academia, resilience is a strength or asset that can make the difference between success and failure, enabling students to overcome obstacles and achieve their goals. Resilience is also a valuable skill in the job market, where flexibility and adaptability are highly valued.

Martin and Marsh (2006) developed a model of academic resilience based on five dimensions (the 5-C model): confidence (self-efficacy), coordination (planning), control, composure (low anxiety), and commitment (persistence). Their study also found that academic resilience is a predictor of three key educational and psychological aspects: enjoyment of school, class participation, and general self-esteem.

Students' self-efficacy and academic motivation can be enhanced by a resilient environment. This fact helps students be more resilient in the university environment (Abdolrezapour et al., 2023). In this sense, motivation, self-efficacy, and academic resilience are interconnected variables that play a crucial role in academic success (Yang & Wang, 2022). By understanding the complex relation between the analyzed variables, educators and researchers can develop effective strategies to support students' academic development and well-being.

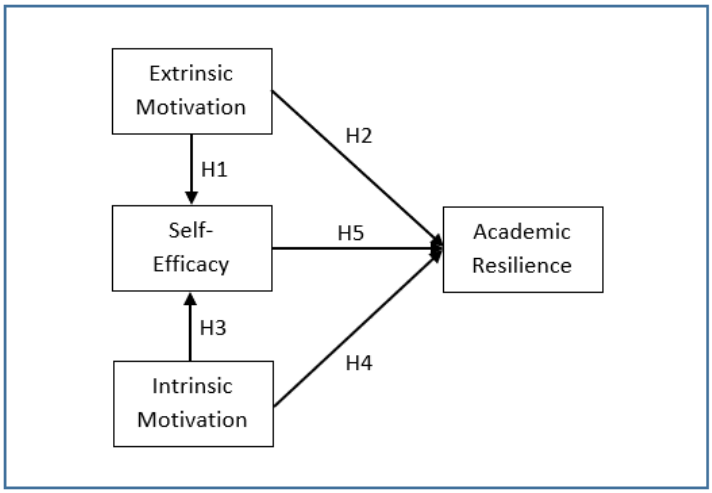
3. Research methodology

3.1. Research model and hypotheses

In general, the relationship between intrinsic motivation, extrinsic motivation, self-efficacy, and academic resilience is complex and generally considered as a multifaceted one (Rossi et al., 2020; Thorsen et al., 2021; Luther, 2022; Shengyao et al., 2024). As expressed in the studies, there is a strong positive correlation between intrinsic/extrinsic motivation and self-efficacy. Intrinsic motivation often leads to higher levels of self-efficacy and academic resilience, and extrinsic motivation can be used strategically to enhance self-efficacy, being (in general) balanced with intrinsic motivation. Self-efficacy plays a crucial role in building academic resilience and maintaining motivation. Academic resilience enables students to stay motivated and perseverant, even in critical situations.

Starting from the abovementioned considerations, a model was proposed taking into account - on the one hand - the interplay between extrinsic/intrinsic motivation and self-efficacy, and - on the other hand - the unidirectional relation between extrinsic/intrinsic motivation/self-efficacy and academic resilience. In this sense, those factors are interconnected and influence each other in various ways. The proposed research model is focused on self-efficacy with self-regulated learning and is illustrated in Figure 1.

Figure 1
Research model and hypotheses



The following hypotheses are tested in the study:

H1 - Extrinsic motivation has a significant influence on academic self-efficacy (EM → SE)

H2 - Extrinsic motivation has a significant influence on academic resilience (EM → AR)

H3 - Intrinsic motivation has a significant influence on academic self-efficacy (IM → SE)

H4 - Intrinsic motivation has a significant influence on academic resilience (IM → AR)

H5 - Academic self-efficacy has a significant influence on academic resilience (SE → AR)

The constructs and measures are presented in Table 1.

Table 1
Evaluation instrument

AR	**Academic resilience**
AR1	I believe I am mentally tough when it comes to exams
AR2	I don't let study stress get top on of me
AR3	I believe I am good at dealing with schoolwork pressures
SEA	**Self-efficacy with self-regulated learning**
SEA1	How well can you finish homework assignments by deadlines?
SEA2	How well can you organize your schoolwork?
SEA3	How well can you concentrate on school subjects?
EM	**Extrinsic motivation**
EM1	I am motivated to study because I want to have a "good life" later on
EM2	I am motivated to study since graduating the college is important
EM3	I am motivated to study by the possibility of finding a high-paying job later on
IM	**Intrinsic motivation**
IM1	I am motivated to study by the pleasure and satisfaction of learning new things
IM2	I am motivated to study by the feelings I experience when I am communicating new things to others
IM3	I am motivated to study by the satisfaction I feel when I am accomplishing difficult academic activities

3.2 Method and sample

In order to collect the necessary research data, a questionnaire was administered to the students of Valahia University of Târgoviște in the first semester of the academic year 2023-2024. Participation in the survey was voluntary and anonymous. From 196 initial responses, 2 questionnaires were incomplete and excluded, resulting in a final sample of 194 participants, that included 108 females and 86 males. All respondents were preparing for a teaching career, being enrolled in the university's psycho-pedagogical training program.

In terms of age distribution, 62.9% of respondents were 19-29 years old, 13.4% (26 students) were 30-39 years old, and the remaining 23.7% (46 students) were 40 years of age or older. The students provided general information such as age, gender, faculty, specialization, year of study, and the discipline or course they were enrolled in. Subsequently, they rated specific items on a 5-point Likert scale.

Convergent validity has been assessed according to the recommended cut-off values (Fornell, & Larcker, 1981; Hair et al., 2006), as regards loadings magnitude (greater than 0.5), construct reliability (composite reliability, CR greater than 0.70), and average variance extracted (AVE, greater than 0.5). Discriminant validity has been assessed through the squared correlation test (Fornell & Larcker, 1981).

The model fit with the data has been assessed by using the following goodness of fit indices (Hu & Bentler, 1998; Hair et al., 2006): chi-square (χ^2), degrees of freedom (DF), χ^2/DF ratio, comparative fit index (CFI), non-normed fit index (NNFI), the goodness of fit index (GFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR).

The model was analyzed with Lisrel 9.3 for Windows (Mels, 2006), using the maximum likelihood estimation method.

3.3. Model testing results

The model has been analyzed for unidimensionality and convergent validity. The descriptive statistics and factor loadings are presented in Table 2.

All factor loadings are over 0.6 thus showing unidimensionality of constructs. The mean values are over the neutral value of 3.00 and suggest a positive perception of academic resilience and self-efficacy and a high perception of motivation to learn. As could be noticed, extrinsic motivation is higher than intrinsic motivation (4.36 vs. 4.26 as regards the mean value of the construct).

Table 2
Descriptive and factor loadings (N=326)

Item	Mean	SD	Loading
AR1	3.78	0.99	0.72
AR2	3.44	1.17	0.58
AR3	3.89	0.99	0.80
SEA1	3.80	1.04	0.70
SEA2	3.77	0.97	0.88
SEA3	3.81	0.88	0.70
EM1	4.37	0.79	0.79
EM2	4.44	0.77	0.79
EM3	4.27	0.91	0.75
IM1	4.45	0.77	0.78
IM2	4.19	0.92	0.84
IM3	4.14	0.94	0.72

The convergent validity is considered very good since, with one small exception, the composite reliability (CR) and average variance extracted (AVE) are over the cut-off values of 0.7, respectively 0.5 (Fornell & Larcker, 1981). The correlation between extrinsic and intrinsic motivation exceeds the square root of the average variance extracted. This is explained by the fact that these are dimensions of the same global factor (motivation) so it is expected to correlate, so discriminant validity is not relevant in this case (Koufteros et al., 2009). For the rest of the constructs, the square root of AVE exceeds the correlation between constructs which is evidence for discriminant validity.

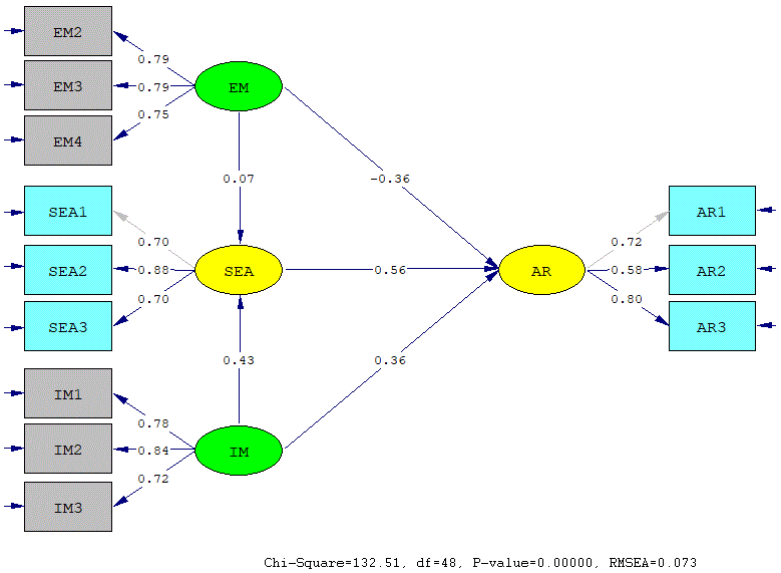
Table 3
Convergent, and discriminant validity (N=326)

	CR	AVE	AR	SEA	EM	IM
AR	0.746	0.499	**0.706**			
SEA	0.807	0.585	0.577	**0.765**		
EM	0.820	0.604	0.189	0.431	**0.777**	
IM	0.824	0.611	0.322	0.483	0.854	**0.782**

Note: The bold diagonal numbers represent the square root of AVE

The fit of the structural model with the data is good, as shown by GOF indices: χ^2 =132.51, *df*=48, χ^2/df=2.76, CFI=0.950, NNFI=0.931, GFI=0.939, RMSEA=0.073, SRMR=0.052. The model estimation results are presented in Figure 2.

Figure 2
Model estimation results – first sample (N=146)



Hypothesis H1 is not supported since extrinsic motivation has a small and non-significant positive influence on self-efficacy with self-regulated. Intrinsic motivation has a positive influence on self-efficacy (β=0.43, p=0.010) so H3 is supported. The rest of the hypotheses are also supported since academic resilience is negatively influenced by extrinsic motivation (β=-0.36, p=0.036), and positively influenced by intrinsic motivation (β=0.36, p=0.042) and self-efficacy (β=0.56, p=0.000).

The model explains a 37% variance in self-efficacy with self-regulated learning and 23.5% in academic resilience.

4. Discussions

This research contributes with an empirically validated model that explains the relationship between extrinsic/intrinsic motivation - self-efficacy - academic resilience.

The first hypothesis - *Extrinsic motivation has a significant influence on academic self-efficacy (EM → SE)* - was not supported, the results of statistical analysis did not indicate a significant relationship between extrinsic motivation and academic self-efficacy. Those findings suggest that, in the context of the present study, extrinsic motivation is not a significant predictor of perceived academic self-efficacy. However, it is possible that other variables, such as intrinsic motivation play a more important role. Future research should explore those issues in more depth.

The second hypothesis - *Extrinsic motivation has a significant influence on academic resilience (EM →*

AR) - was supported, but the relationship between extrinsic motivation and academic resilience is a negative one. This result suggests that increased reliance on external rewards may reduce students' ability to cope with academic difficulties. This is also explained by Deci et al. (1991), who state that excessive extrinsic motivation may undermine perceptions of autonomy and competence, thereby affecting resilience. The results emphasize the need to encourage intrinsic motivation in educational settings to support the development of academic resilience. Future research should explore the role of intermediate variables, such as stress or coping strategies, in this relationship. The result is valuable because it indicates that extrinsic motivation needs to be carefully managed in educational settings. Rather than being excluded, it should be complemented by strategies that promote intrinsic motivation and support students' emotional and psychological adaptability to challenges.

The third hypothesis - *Intrinsic motivation has a significant influence on academic self-efficacy (IM → SE)* - was confirmed. This positive relationship suggests that students who learn out of interest and curiosity show greater confidence in their own academic abilities. Those findings are sustained by Deci et al. (1991), who indicate that satisfaction of psychological needs for competence and autonomy support perceptions of self-efficacy. This result highlights the importance of cultivating intrinsic motivation in educational settings to improve both academic engagement and academic performance.

The fourth hypothesis - *Intrinsic motivation has a significant influence on academic resilience (IM → AR)* - was supported. This result emphasizes that intrinsic motivation is an important condition in developing students' ability to overcome obstacles and maintain academic performance under stressful conditions, in line with numerous theories suggesting that internal motivation is a key factor in developing resilience and long-term success in education. Thus, it is recommended that educational environments facilitate the development of students' intrinsic motivation.

The fifth hypothesis - *Academic self-efficacy has a significant influence on academic resilience (SE → AR)* - was confirmed. This result indicates that students who have a high level of academic self-efficacy tend to be more resilient in the face of academic difficulties, as confidence in their own abilities contributes to a greater ability to cope with stress, overcome failures and persevere in the educational context. Thus, academic self-efficacy is a protective factor against academic challenges and difficulties. These findings are consistent with previous studies (Bandura, 1993, 2006), which have shown that self-efficacy is an important predictor of adaptive behaviors and academic success.

Since this is an exploratory study, there are some inherent limitations. The first limitation of this study is the sample of students used in the research, which may not be representative of the entire student population, as they are students from a single university. Another limitation may be related to the fact that students involved in the research are enrolled in a program for a teaching career, so the constructs proposed in the research model may have deeper meanings for them as future teachers.

6. Conclusions

The results of the research provide useful insights into the relations between the four important variables for learning in the academic environment: intrinsic motivation, extrinsic motivation, academic resilience and academic self-efficacy. In any educational context, motivation is the key factor that activates and sustains the learning process. The theoretical model proposed and discussed in this research indicates positive correlations and significant influences of intrinsic motivation on academic self-efficacy and academic resilience, academic self-efficacy has a significant influence on academic resilience, extrinsic motivation has a significant influence on academic resilience, but extrinsic motivation has not been shown to have a significant influence on academic self-efficacy.

Students who are academically motivated tend to view education and learning as intrinsically valuable and meaningful. They recognize the importance of academic achievements not just as a means to external rewards, such as grades or career prospects, but as essential for personal growth and intellectual development. This perspective fosters a genuine enthusiasm for acquiring knowledge and mastering new skills, which translates into a positive attitude toward school and educational activities.

The students often derive enjoyment from the learning process itself, finding satisfaction in exploring ideas, solving problems, and overcoming challenges. Their intrinsic interest in learning encourages them to actively participate in academic tasks, whether it involves class discussions,

completing assignments, or pursuing independent study.

Additionally, academically motivated individuals tend to exhibit higher levels of perseverance and resilience when faced with difficulties, as they are driven by a deeper sense of purpose and curiosity. They are engaged not only for immediate results but also for the long-term benefits of education, which include personal fulfillment, critical thinking skills, and a broader understanding of the world. Their positive engagement often sets the stage for sustained academic success and a lifelong commitment to learning.

Another key dimension highlighted by the research findings is the concept of academic resilience. This is the ability of students to cope successfully with challenges and obstacles in the academic environment while maintaining their motivation, performance and engagement in learning.

Academic resilience involves a combination of skills and attitudes that enable students to cope effectively with difficulties such as exam pressure, heavy workloads, negative feedback or potential failure. Moreover, this dimension is not just about overcoming difficulties but also about using their experiences as opportunities for learning and personal development. A defining aspect of academic resilience is the mental and emotional flexibility, which helps students to adapt their learning strategies to each faced situation. For example, resilient students tend to be more likely to seek social support, adopt effective stress management strategies, and show increased confidence in their ability to overcome obstacles. This dimension is critical to long-term success as it supports students not only in achieving academic performance but also in developing valuable life skills.

Research has also shown that extrinsic motivation characterized by external rewards (such as grades, prizes, parental approval or avoidance of punishment) does not directly and significantly influence the student's confidence in his/her own ability to learn and succeed academically. This finding carries several psycho-pedagogical implications, particularly in the design and implementation of educational strategies and interventions. An educational approach focused on cultivating intrinsic motivation can have a far more positive impact on a student's self-efficacy. Educators should design learning environments that prioritize intrinsic motivators, such as curiosity, mastery, and personal growth, over external rewards. This fact has the potential to produce not only better academic outcomes but also students who are more resilient, self-confident, and prepared to navigate challenges independently in the future.

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